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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,750	05/15/2007	Van Suong Hoa	789-100	1088

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EXAMINER

FEELY, MICHAEL J

ART UNIT	PAPER NUMBER
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1761

MAIL DATE	DELIVERY MODE
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03/14/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/596,750	Applicant(s) HOA ET AL.	
	Examiner Michael J. Feely	Art Unit 1761	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on February 28, 2011 & March 1, 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-13,20-24,26 and 27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,3-13 and 27 is/are allowed.
- 6) ☒ Claim(s) 20-24 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Pending Claims

Claims 1, 3-13, 20-24, 26, and 27 are pending.

Priority

1. The instant application is a national stage entry of PCT/CA04/02184, filed December 22, 2004, which claims priority to US provisional application no. 60/531,618, filed December 23, 2003.

- Claims 1, 3-16, 18-24, 26, and 27 are fully supported by the provisional application; accordingly, they have an effective filing date of December 23, 2003.

Declaration Filed Under 37 CFR 1.131

2. Multiple signed copies of a declaration under 37 CFR 1.131 were filed on February 28, 2011 and March 1, 2011. The declaration is sufficient to overcome the Drzal et al. (US 2005/0119371) reference. Accordingly, the following rejections have been overcome:

- The rejection of claims 20-22 and 24 under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Drzal et al. (US 2005/0119371).
- The rejection of claims 23 and 26 under 35 U.S.C. 103(a) as being unpatentable over Drzal et al. (US 2005/0119371) in view of Furihata (US Pat. No. 4,465,542).

Claim Rejections - 35 USC § 102/103

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 20-22 and 24 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chen et al. (XP008051803).

Regarding claims 20, 21, and 24, Chen et al. disclose: **(20)** a modified epoxy produced from a pristine epoxy (Abstract) comprising: solvent (page 364: “2.1.Materials”; “2.3.Processing: Solvent-assisted method”), nano-clay particles (page 364: “2.1.Materials”; “2.3.Processing: Solvent-assisted method”), and pristine epoxy (page 364: “2.1.Materials”; “2.3.Processing: Solvent-assisted method”), wherein clay particles of nano-dimensions are finely and homogeneously distributed in the modified epoxy (page 364: “2.1.Materials”; “2.3.Processing: Solvent-assisted method”); the modified epoxy having at least higher barrier properties and thermal resistance than the pristine epoxy (page 373: Tables IV; page 374: Figure 6); and

(21) comprising finely dispersed clay agglomerates of less than about 1 μm and agglomerates of a maximum diameter between about 1 μm and 2 μm (Abstract; pages 362-363:

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“Introduction”; page 364: “2.1.Materials”; “2.3.Processing: Solvent-assisted method”; pages 365-368: “3.2. Epoxy-Silicate Nanocomposites”); and **(24)** further comprising additives (page 364: “2.1.Materials”; “2.3.Processing: Solvent-assisted method” – see modified clay, curing agent).

Chen et al. form their dispersion by: (a) creating a solution of solvent, nano-clay, and epoxy resin; and (b) mechanically stirring and sonicating the solution (page 364: “2.3. Processing: Solvent-assisted method”). Accordingly, Chen et al. fail to disclose the claimed steps of:

(a) mixing solvents and clay particles of a dimension in the nanometer range to form a clay solution, agglomerates of clay particles forming in the clay solution;

(b) submitting a flow of the clay solution to: (1) high pressure; (2) a high velocity and breaking impacts in a region of obstacles to allow the agglomerates to be broken down; and (3) a sudden lower pressure; and

(c) mixing the dispersed clay solution with at least part of the pristine epoxy.

However, it should be noted that the instant claims are provided in product-by-process format. In light of this, it has been found that, “[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process,” – In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (see MPEP 2113).

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Therefore, it appears that the instantly claimed modified epoxy is the same or an obvious variation of the one set forth in Chen et al. because the final product of Chen et al. satisfies all of the material/chemical limitations of the instant invention.

Regarding claim 22, the teachings of Chen et al. are as set forth above and incorporated herein. Chen et al. fail to explicitly disclose: **(22)** wherein a content of about 1 wt % of clay loading yields an increase in a fracture toughness, with an increase in K_{IC} and G_{IC} of up to 2 and 3 times with respect to the pristine epoxy respectively. However, it appears that the composition of Chen et al. would have been inherently capable of satisfying the property limitations of claim 22 at the appropriate loadings (which are not explicitly required by the claim).

In light of this, it has been found that, “Products of identical chemical composition can not have mutually exclusive properties.” A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present – In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Therefore, it appears that the composition of Chen et al. would have been inherently capable of satisfying the property limitations of claim 22 at the appropriate loadings.

Claim Rejections - 35 USC § 103

6. Claims 23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (XP008051803) in view of Furihata (US Pat. No. 4,465,542).

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Regarding claim 23, the teachings of Chen et al. are as set forth above and incorporated herein. Chen et al. desire toughness and flexibility in their composition; however, they fail to explicitly disclose: **(23)** wherein said pristine epoxy is a rubber-modified epoxy.

The teachings of Furihata demonstrate that rubber materials, such as CTBN, are recognized in the art as suitable additives (modifiers) for epoxy/clay compositions that require toughness and flexibility (see Abstract; column 6, lines 37-53). In light of this, it has been found that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination – see MPEP 2144.07.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add rubber to the composition of Chen et al. because the teachings of Furihata demonstrate that rubber materials are recognized in the art as suitable additives (modifiers) for epoxy/clay compositions that require toughness and flexibility.

Regarding claim 26, the combined teachings of Chen et al. and Furihata are as set forth above and incorporated herein. The combined teachings fail to explicitly disclose: **(26)** the modified epoxy has an increase in K_{IC} and G_{IC} of up to 2.2 and 7.6 times at 6-phr loading and 20-phr CTBN compared with the pristine epoxy. However, it appears that the combined teachings would have been inherently capable of satisfying these property limitations at the appropriate loadings (which are not explicitly required by the claim).

Furthermore, it has been found that, “Products of identical chemical composition can not have mutually exclusive properties.” A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant

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discloses and/or claims are necessarily present – In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Therefore, it appears that the combined teachings of Chen et al. and Furihata would have been inherently capable of satisfying the property limitations of claim 26 at the appropriate loadings.

Response to Arguments

7. Applicant's arguments with respect to claims 20-24 and 26 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

8. Claims 1, 3-13, and 27 are allowed.

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Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Feely whose telephone number is (571)272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Y. Pyon can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael J Feely/
Primary Examiner, Art Unit 1761

March 10, 2011